

## **Forensic Evaluation of Video Footage from the TIGHAR 2010 Nikumaroro Expedition – Supplemental Report 2**

By: Jay M. Vincelli, MSc

**June 4, 2014**

### **Introduction:**

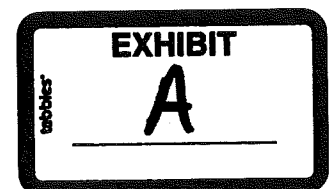
This is a supplement to Dr. John D. Jarrell's prior supplemental report, which was dated February 28, 2014. Raw videos were obtained from the videographer in their native, digital format through legal discovery. In these videos, the timestamps were not present, which allowed for greater clarity and quality of processing the videos compared with the time stamped videos used in the previous supplemental report. In this report, the methods used in the initial supplemental report, dated February 28, 2014, were repeated, but the new, raw video (ROV OPS\_0010134 0012XO.mov) was used as a new input for analysis. The video frames used for this analysis were de-interlaced from the raw video and provided by Fatih Calakli, whose June 4, 2014 supplemental report details the video conversion process.

### **Results:**

The CAD model of the proposed rear landing gear was fit to a de-interlaced video frame in two different poses, similarly to the poses in the previous supplemental report. Using the specified size of the tire, the wire was calculated to be approximately 0.61 inches in diameter for the first fit (Figure 1) with a standard deviation of 0.01 inches, and approximately 0.63 inches in diameter for the second fit (Figure 2) with a standard deviation of 0.01 inches.

The CAD model of the proposed front landing gear was fit to a de-interlaced video frame (Figure 3), similarly to the previous supplemental report. Using the specified size of the front landing gear, the wire was calculated to be approximately 0.71 inches in diameter with a standard deviation of 0.03 inches.

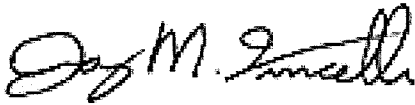
Furthermore, the front landing gear was fit to a historical photograph of Amelia Earhart's crash at Luke Field, Hawaii on March 20, 1937 (Figure 4 & Figure 5). The front landing gear was in close proximity to rope lying on the ground next to the crashed airplane. Using the same technique as in the 2010 underwater video, the rope was observed to have a diameter of 0.64 inches with a standard deviation of 0.04 inches. There was also rope that was wound and looped neatly together in the same vicinity. There were approximately 10 windings, and accounting for the central loops, the rope was estimated to be approximately 35 feet in length. Using an image containing both the front and rear landing gears, and using the diameter of the rear wheel as a reference, the length of the rope in this field of view was 16 feet.



**Conclusions:**

- When CAD models of the front and rear landing gears were fit to underwater features which are proposed to be these landing gears, the size and pose of the front and rear landing gear of Amelia Earhart's Lockheed Electra E aircraft independently calculate similar diameters to the rope seen near each component.
- The rope seen in the raw, 2010 underwater video (ROV OPS\_0010134 0012XO.mov) was determined to have an estimated rope diameter of 0.66", which is similar to the rope size determined by Fatih Calakli in his June 4, 2014 supplemental report (0.6" diameter), which used the size of the rover's jaw grabber as an independent object of known size to determine the rope diameter.
- The rope seen at the Luke Field crash site is consistent in diameter (0.64" average) to the rope observed in the 2010 underwater video. In addition, the length of the rope seen in the 2010 underwater video in close proximity to the front and rear landing gears is less than the total rope length seen in the Luke Field crash site photograph.

Sincerely,  
Materials Science Associates, LLC

A handwritten signature in black ink, appearing to read "Jay M. Vincelli". The signature is fluid and cursive, with the first name "Jay" and last name "Vincelli" clearly distinguishable.

Jay M. Vincelli, MSc  
Materials Science Engineer

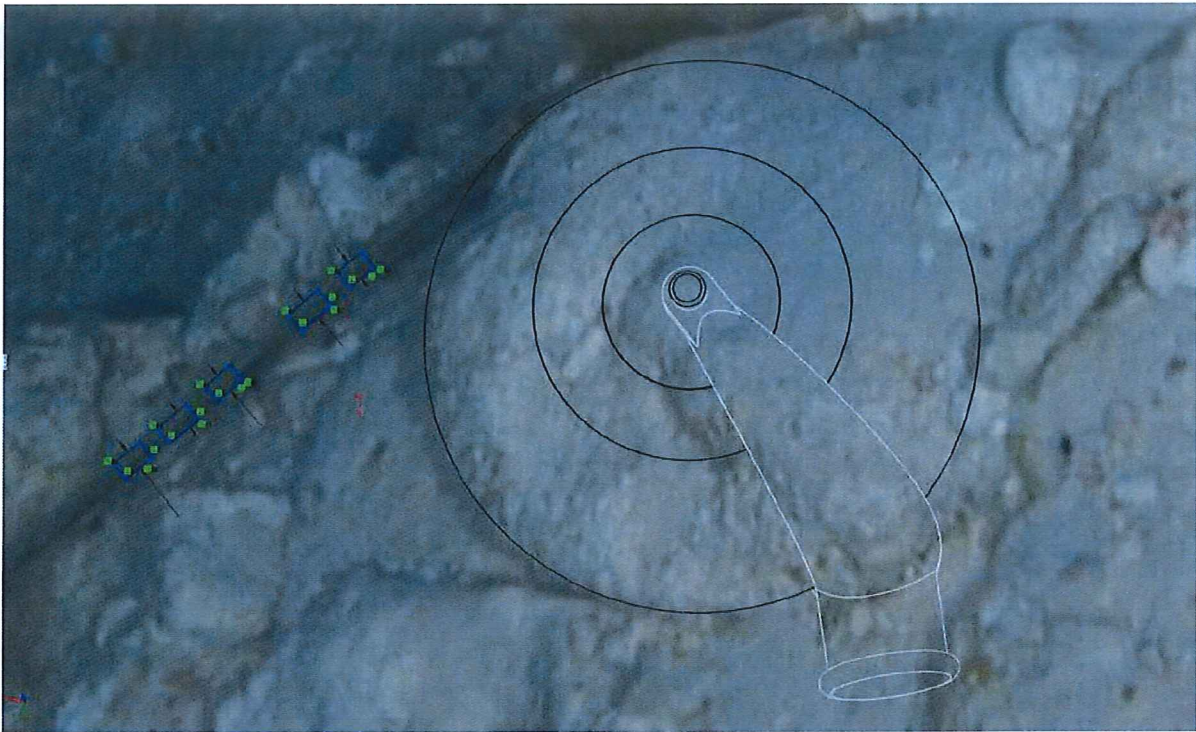


Figure 1: The first fit of the rear landing gear resulted in a rope diameter of 0.61" with a standard deviation of 0.01".



Figure 2: The second fit of the rear landing gear resulted in a rope diameter of 0.63" with a standard deviation of 0.01".



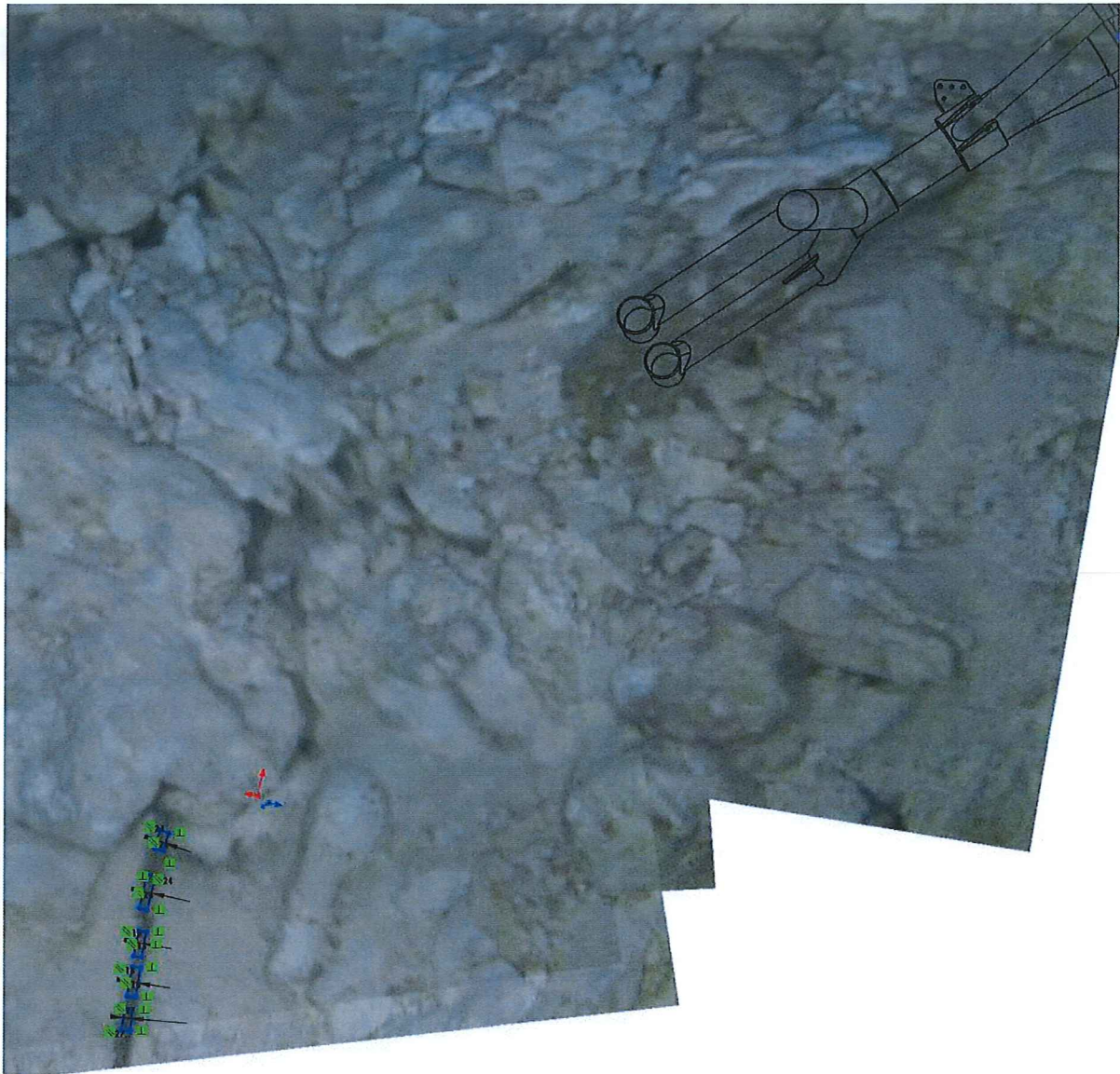


Figure 3: The fit of the front landing gear resulted in a rope diameter of 0.71" with a standard deviation of 0.03".

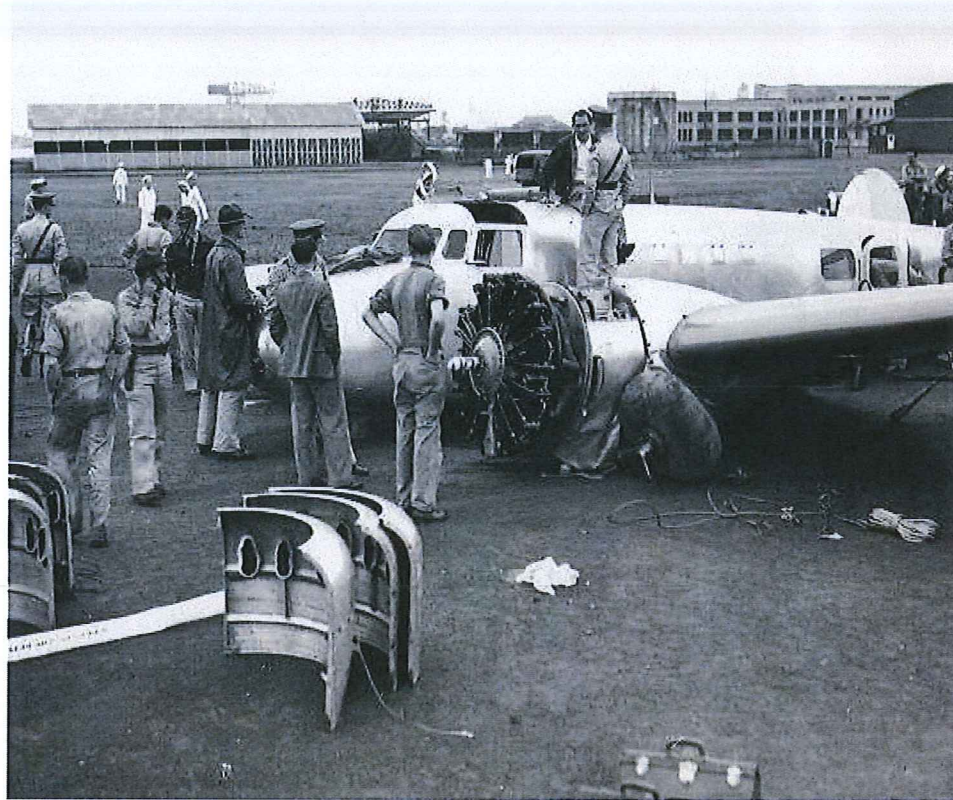


Figure 4: Amelia Earhart's crash at Luke Airfield on March 20, 1937.

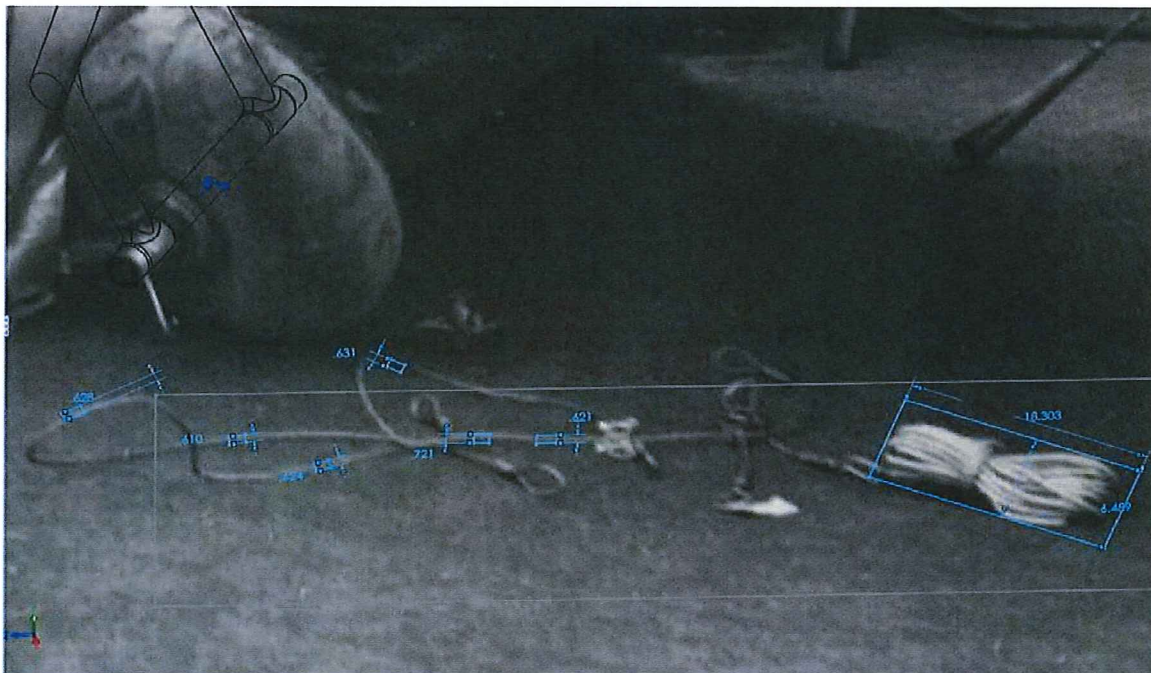


Figure 5: The rope was measured to have a diameter of 0.64" with a standard deviation of 0.04". The wound rope was observed to have approximately 10 coils, and accounting for the central loops, was estimated to be 35 feet in length.



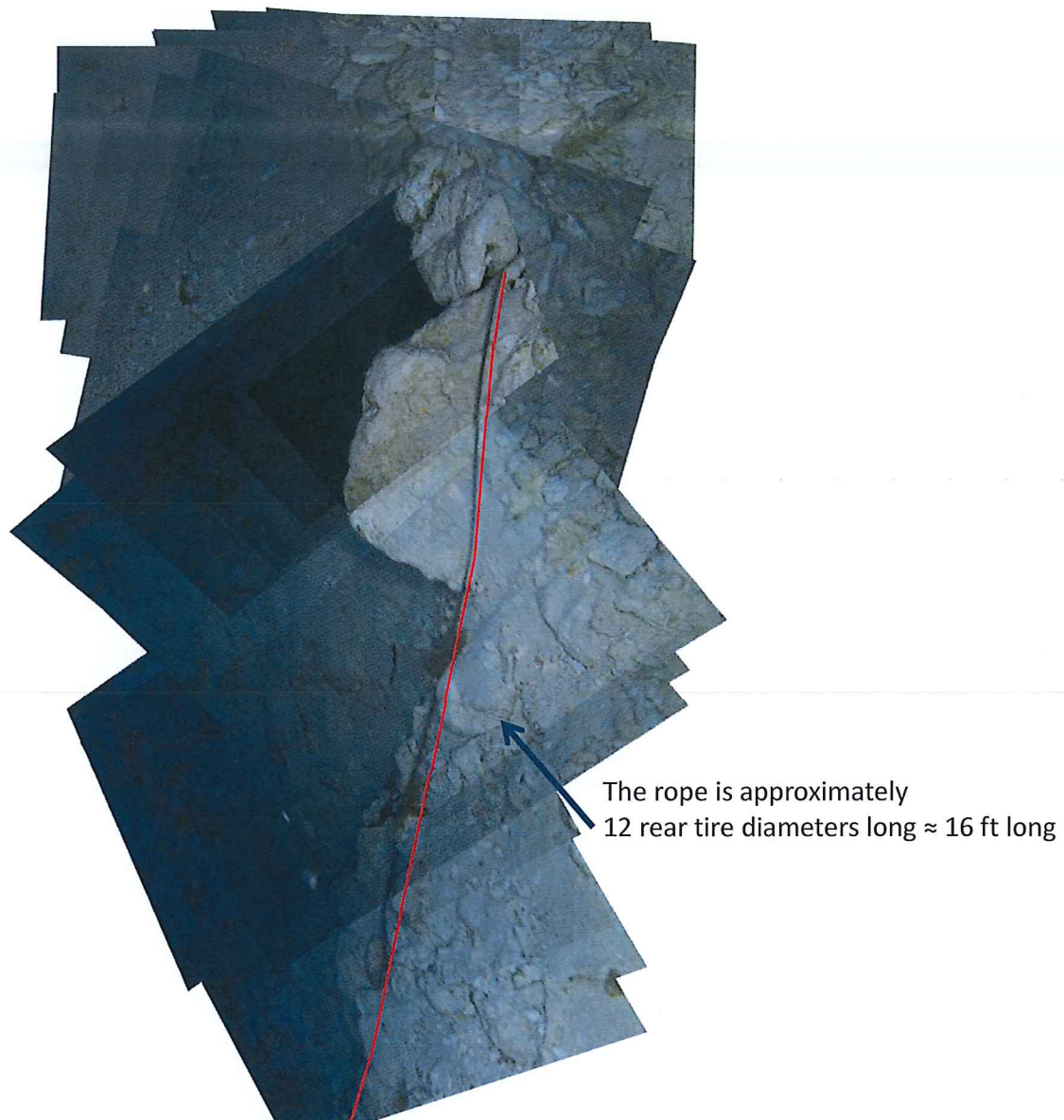


Figure 6: The rope in the field of view between the proposed front and rear landing gears is approximately 16 feet long.